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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,985	07/09/2001	Kenneth L. Riley	GJH-0006	4473

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EXAMINER

ARNOLD JR, JAMES

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 01/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/869,985

Applicant(s)

RILEY ET AL.

Examiner

James Arnold, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Specification*

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "said feedstream" in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 1, it is not understood what is meant by the phrase "as is passes". Appropriate clarification and correction is required.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawyer (ep-0 419 266) in view of George A. Olah, Hydrocarbon Chemistry, 1995.

The Sawyer reference discloses a process for producing a hydrocrackate having a relatively low sulfur and nitrogen content. Page 2 lines 4-6. The reference discloses reacting a feed stream in the presence of hydrogen treat gas. Page 3 line 22 and Page 7 lines 53-54. The reference discloses utilizing a catalyst bed comprised of a bulk multimetallic comprised of at least one Group VIII non-noble metals and at least two Group VIB noble metals. Page 4, lines 19-30. The reference discloses a process wherein a Group VIII non-noble metal is selected from Ni and Co and the Group VIB metals are selected from Mo and W. Page 4, lines 19-30. The reference discloses a process wherein the Group VIII non-noble metal is nickel. Page 4, lines 19-30. The reference discloses a process whereby a feedstock is hydrotreated to produce an effluent that is passed into a separation zone. Page 2 lines 24-32, Page 5, lines 40-48.

The Sawyer reference does not disclose a process for producing a hydrocrackate utilizing two or more catalyst beds composed of an upstream and downstream catalyst bed. The reference does not disclose a process wherein the ratio of Group VIB metals to Group VIII non-noble metals is about 10:1 to about 1:10. The reference does not disclose the use of a hydrocracking

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catalyst whose single reaction stage is operated at a temperature equivalent to about 300 to 450 C and hydrogen pressure equivalent to the range of about 85 to 200 bar. The reference does not disclose a process wherein two Group VIB metals are present as Mo and W and the ratio of Mo to W is about 9:1 to about 1:9. The reference does not disclose a process wherein the bulk multimetallic catalyst is a trimetallic catalyst represented by the formula,  $(X)_b(Mo)_c(W)_dO_z$ , wherein X is a group VIII non-noble metal, the molar ratio of  $b:(c+d)$  is 0.5/1 to 3/1. The reference does not disclose a process wherein the bulk multimetallic catalyst is amorphous and has an X-ray diffraction pattern showing crystalline peaks at  $d=2.53$  Angstroms and  $d=1.70$  Angstroms. The reference does not disclose a process whereby the effluent from the hydrotreating stage is subsequently hydrocracked. The reference does not disclose a process wherein the bulk multimetallic is represented by the formula,  $(X)_b(Mo)_c(W)_dO_z$ , and wherein the molar ratio of  $b:(c+d)$  is 0.5/1 to 3/1, preferably 0.75/1 to 1.5/1, more preferably 0.75/1 to 1.25/1. The reference does not disclose a process wherein the molar ratio of  $c:d$  is preferably  $>0.01/1$ , more preferably  $>0.1/1$ , still more preferably 1/10 to 10/1, still more preferably 1/3 to 3/1, most preferably substantially equimolar amounts of Mo and W, e.g., 2/3 to 3/2; and  $z = [2b+6(c + d)]/2$ .

The Olah reference discloses the use of a hydrocracking catalyst whose single reaction stage is operated at a temperature equivalent to about 300 to 450 C and hydrogen pressure equivalent to the range of about 85 to 200 bar. See page 30.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process for producing a hydrocrackate utilizing two or more catalyst beds composed of an upstream and downstream catalyst bed because both catalyst beds

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are used for the same purpose of desulfurization and denitrification of the hydrocarbons. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the ratio of Group VIB metals to Group VIII non-noble metals is about 10:1 to about 1:10 because the Group VIB metals and Group VIII non-noble metals are essential parts of the catalyst and it would be appropriate to use them in any combination effective for hydrotreating. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a hydrocracking catalyst whose single reaction stage is operated at a temperature equivalent to about 300 to 450 C and hydrogen pressure equivalent to the range of about 85 to 200 bar because these are standard conditions for hydrocracking. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein the bulk multimetallic catalyst is a trimetallic catalyst represented by the formula,  $(X)_b(Mo)_c(W)_dO_z$ , wherein X is a group VIII non-noble metal, the molar ratio of  $b:(c+d)$  is 0.5/1 to 3/1 because the combination of X, W, and Mo are disclosed by the Sawyer reference and this combination can be supported on an inorganic oxide and because all the constituent components are disclosed by the reference and it would be appropriate to use them in any combination effective for hydrotreating. Furthermore, the Sawyer reference discloses the use of NiO and MoO<sub>3</sub> as hydrotreating catalysts. See Sawyer page 6, lines 15-25. It would have been obvious to one having ordinary skill in the art at the time the invention was made wherein the bulk multimetallic catalyst is amorphous and has a unique X-ray diffraction pattern showing crystalline peaks at  $d=2.53$  Angstroms and  $d=1.70$  Angstroms because diffraction peaks represent the characteristics of the reacted metal components. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize

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a process whereby the effluent from the hydrotreating stage is subsequently hydrocracked because subsequent hydrocracking is utilized to further remove nitrogen and sulfur from the hydrocarbon effluent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process with a bulk multimetalllic,  $(X)_b(Mo)_c(W)_dO_z$ , where the molar ratio of b: (c+d) is 0.5/1 to 3/1, preferably 0.75/1 to 1.5/1, more preferably 0.75/1 to 1.25/1, and to utilize a process wherein the molar ratio of c:d is preferably  $>0.01/1$ , more preferably  $>0.1/1$ , still more preferably 1/10 to 10/1, still more preferably 1/3 to 3/1, most preferably substantially equimolar amounts of Mo and W, e.g., 2/3 to 3/2; and  $z = [2b+6(c + d)]/2$  because all the constituent components are disclosed by the reference and it would be appropriate to use them in any combination effective for hydrotreating.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawyer (ep-0 419 266) and George A. Olah, Hydrocarbon Chemistry, 1995 as applied to claim 1 above, and further in view of Velenyi (USPN 4,808,563).

The Velenyi reference discloses a molar ratio equivalent to the range of about 9:1 to about 1:9 for Mo and W. See abstract.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process wherein two Group VIB metals are present as Mo and W and the ratio of Mo to W is about 9:1 to about 1:9 because the Group VIB metals, Mo, and W are essential parts of the catalyst and it would be appropriate to use them in any combination effective for hydrotreating.

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***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gosselink (USPN 5,112,472).

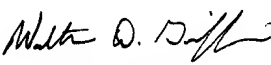
The Gosselink reference disclose the use of Group VI and Group VIII metals in the hydrocarbon conversion process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Arnold, Jr. whose telephone number is 703-305-5308. The examiner can normally be reached on Monday-Thursday 8:30 AM-6:00 PM; Fridays from 8:30 AM -5:00 PM with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

ja  
January 15, 2003

  
**Walter D. Griffin**  
**Primary Examiner**